IN THE UNITED STATES BANKRUPTCY COURT
FOR THE DISTRICT OF DELAWARE

In re	)	**Chapter 11 Case No.**
	)	
ARMSTRONG WORLD INDUSTRIES, INC., *et al.*,	)	**00-4471 (RJN)**
	)	
Debtors.	)	**(Jointly Administered)**
	)	
	)	

ARMSTRONG WORLD INDUSTRIES' *DAUBERT* HEARING BRIEF[1]

"There is no regulatory standard for this 'settled dust', it is designed to look like a 'big' hazard for the litigation."

Internal Memorandum of University of Illinois
Division of Environmental Health and Safety, June 11, 2001.

I. Introduction

The PD Claimants seek to recover compensation for property damage allegedly caused by the release of asbestos fibers from floor products manufactured by AWI. To make out their claims, the PD Claimants must show that there is a significant "risk of harm" from such floor products such that a prudent property owner would replace or remove those products to abate the risk. Asbestos fibers, however, represent a hazard to human beings only if they are breathed into the lungs in sufficient quantities to cause disease. As stated by the EPA, "[a]sbestos must be in the air to pose a health problem." (Environmental Protection Agency, "EPA Response to

[1] This brief is filed pursuant to the Court's order dated August 14, 2002, and serves as a combined memorandum (i) in support of the Motion Of Armstrong World Industries, Inc. For *Daubert* Hearing On Property Damage Claims And To Exclude Certain Evidence Related To Asbestos Property Damage Claims, and (2) in opposition to the Motion Of The Official Committee Of Asbestos Related Property Damage Claimants To Preclude The Debtors' Expert Testimony, each of which was filed on August 2, 2002. In this brief, Armstrong World Industries, Inc. will be referred to as "AWI"; the Official Committee of Asbestos Related Property Damage Claimants will be referred to as the "PD Committee"; and the property damage claimants collectively will be referred to as the "PD Claimants."

September 11," Frequently Asked Questions, *available at* http://www.epa.gov/wtc/questions/index.html at 4) (Exh. 1).)[2]

Accordingly, for many years now scientists have used widely accepted methods of air monitoring to analyze and report the concentration of respirable asbestos in the air that people breathe. "There are accepted health-based scientific protocols in place for conducting air tests and evaluating the results." (*Id.*) Indeed, the PD Claimants' own medical expert, Dr. Arthur Frank, testified more than 15 years ago that an evaluation of the potential hazard from asbestos in a floor covering was "easy to do" and the relevant information was "easily come by": "You do the [air] monitoring in a . . . public school, in a public building, in a private home, and you can get some numbers as to how much asbestos is really in the air." (Commonwealth of Kentucky Consumers' Advisory Council, Public Forum on Asbestos, Transcript of Proceedings at 32 (January 8, 1985) (Exh. 2).)

The PD Claimants in this bankruptcy, however, seek to evaluate whether a potential hazard exists from release of asbestos from floor products by using a method of analyzing and reporting the concentration of asbestos in *dust* settled on such a floor, rather than in the air itself. AWI has moved to exclude evidence from the "settled dust" method because it does not meet the standards for admissibility of scientific or technical evidence set forth by the Supreme Court in *Daubert* and its progeny. Simply put, the settled dust method is not a reliable test of the asbestos in dust that is, or can be, put back into the air to create a hazard. Instead, as a safety officer for one of the PD Claimants, the State of Illinois, aptly observed, the settled dust method is simply

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2 AWI has referenced in this brief a number of exhibits it intends to introduce at the *Daubert* hearing. For the Court's convenience, Appendix A contains a list of those exhibits.

"designed to look like a 'big' hazard for the litigation." (6/13/01 Memorandum from Patricia Kerst to Van Anderson at 1 (Exh. 3); Kerst Dep. at 81-85.)

The dust method fails under *Daubert* for each of the following reasons:

1. The method for collecting samples of dust introduces uncontrolled variability, the extent of which is unknown, because of variations in surface texture, cleaning history, nozzle velocity, and collection technique, and because the distribution of dust on a floor surface is non-random.

2. The "indirect" method specified for analyzing dust samples alters the material that is collected by shaking and sonicating it in acidic solution, which introduces a large, but variable, bias into the reported results.

3. The dust method is particularly unsuited for debris abraded from a vinyl or asphalt floor product because the transmission electron microscopy (TEM) method of analysis dissolves vinyl and asphalt matrix particles holding asbestos fibers together, leading to a false positive report of numerous individual fibers.

4. Even if the dust method accurately reported asbestos concentrations in settled dust -- which it does not -- it cannot be used to predict the concentration of respirable asbestos that is, or may be, in the air because, as stated by the EPA, there is no "scientific agreement on the relationship between what is in the dust and what is in the air."[3] Indeed, side-by-side dust testing and air monitoring with flooring products suggests that little or no respirable fibers from floor products become suspended in air during routine building activities.

5. For all the reasons stated above, the settled dust method has not won general acceptance as a measure of the human exposure hazard posed by asbestos.

In short, the settled dust method is unreliable and measures the wrong endpoint -- dust rather than air -- and thus should be excluded as evidence in support of the PD Claimants' claims.[4]

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3 EPA Response at 5 (Exh. 1).

4 The PD Claimants have also challenged, under *Daubert*, certain of AWI's experts and certain evidence offered by those experts. As shown in section IV of this brief, those challenges are without merit.

II. Factual and Procedural Background to the *Daubert* Hearing

Prior to its bankruptcy filing in December 2000, AWI had only six unresolved property damage claims pending against it based on asbestos in floor products. Notwithstanding that AWI has not manufactured any resilient floor covering product with asbestos in it since 1983, several hundred new property damage claims were filed in the bankruptcy, mostly by a handful of law firms on the eve of, or even after, the bar date for such claims.[5] These are opportunistic claims that have no merit. In April of this year, the Court extended the bar date to include late filed property damage claims, but then set a liability hearing on September 26-27 to determine the validity of all claims involving flooring products. (*See* March 22, 2002 Omnibus Hearing Tr. at 24-27.)

The Court subsequently entered an order, dated April 28, 2002, memorializing its rulings on scheduling and procedures "regarding whether asbestos-containing resilient floor covering products manufactured and sold, marketed or distributed by [AWI] give rise to property damage liability." Notably, the Court had set a deadline of April 1, 2002 by which all parties were to produce "any testing results" to be relied upon in making the liability determination and provided that a party could "conduct additional testing to be used at trial" only upon notice to the other side. (*See* March 22, 2002 Tr. at 25, 29; April 28, 2002 Order at 1.) Thereafter, the PD Committee produced testing results for only two claimants: the State of Illinois and the Los

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5 With the Court's order denying certification of a class of property damage claims, as of July 31, 2002, the remaining universe of property damage claims consists of 545 claims filed by 431 claimants, of whom 394 are represented by three law firms: Speights & Runyan (330); Ness Motley P.A. (32) and Philip J. Goodman, P.C. (32). None of these 394 claimants, who are predominantly commercial or institutional building owners, had property damage lawsuits pending against AWI prior to the chapter 11 filing. Approximately 14 of the 431 claimants are state or governmental entities (the Commonwealth of Pennsylvania has withdrawn its claim for property damage), and 15 have asserted residential asbestos property damage claims.

Angeles Unified School District, both of which rely upon results of settled dust testing. No other claimant produced *any* testing results, and no PD Claimant has given notice of an intent to conduct additional testing.

Following subsequent proceedings regarding whether to certify a property damage class claim, which the Court ultimately denied, the Court expressed some concern about whether variations in state law governing property damage claims might make such a proceeding unwieldy and asked the parties to comment on the issue. Thereafter, the Court agreed to AWI's proposal to convert the liability hearing into a *Daubert* hearing on the PD Claimants' scientific evidence because the Federal Rules of Evidence impose a uniform standard for such evidence in all of the pending property damage claims. (*See* July 19, 2002 Omnibus Hearing Tr. at 62-68.) The issues for the *Daubert* hearing were then framed by submissions that the Court ordered the parties to file by August 2, 2002.

The property damage claims against AWI arise out of three types of resilient floor covering products made by AWI that contained asbestos:

1. Asphalt tile. Until 1972, AWI manufactured a low cost asphalt tile that contained asbestos. Because these tiles are at least 30 years old, there are few claims involving them.

2. Vinyl asbestos tile. Until 1983, AWI manufactured a vinyl asbestos tile, called Excelon, which was very popular and has held up well over the years, and thus accounts for most of the property damage claims against AWI.

3. Sheet vinyl flooring. AWI manufactured sheet vinyl floor coverings that contained no asbestos. AWI also made a felt backing material, called Hydrocord, for use when sheet vinyl was laid directly over on-grade concrete, and which did contain asbestos until 1983. There are few claims with respect to this product because Hydrocord backing is not subject to any abrasion unless the vinyl surface layer has completely worn through.

To date, the regulatory and scientific consensus is that floor products with asbestos are safe if managed prudently by a property owner. Since the early 1970s, asbestos products in

buildings, including floor products, have been subjected to significant regulatory scrutiny by both the Occupational Safety and Health Administration ("OSHA") and the Environmental Protection Agency ("EPA"). OSHA has recognized that "[m]aterials such as vinyl-asbestos floor tile . . . are considered nonfriable and generally do not emit airborne fibers unless subjected to sanding or sawing operations." 51 Fed. Reg. 22,612, 22,754 (June 20, 1986). OSHA has approved a set of flooring industry work practices for both maintenance and removal of floor tile as sufficient to protect the safety of workers from airborne asbestos when engaged in such activities. *See* 29 C.F.R. § 1926.1101 (g)(10), (k)(9)(vi), and (1)(3) (maintenance); 29 C.F.R.§ 1926.1101 (g)(7)-(8) (removal)(2002).

Likewise, EPA has consistently treated activities involving asbestos-containing resilient floor materials as presenting low asbestos exposure and minimal health risks, noting as early as 1974 that "asbestos fibers in [nonfriable] floor tile are tightly bound and cannot escape easily[.]" 39 Fed. Reg. 38,064, 38,065 (Oct. 25, 1974). More than fifteen years later, in 1990, the EPA continued to classify nonfriable asbestos containing flooring materials as exempt from its national emission standards for hazardous air pollutants ("NESHAP") regime unless those products were sanded, sawed, drilled, chipped, ground, or abraded, 40 C.F.R. § 61.141, having concluded after a comprehensive literature review of scientific studies that the "potential for fiber release" from floor products "is minimal" and that such products "do not appear to present an air pollution problem or a health threat to the public." (*See* 11/28/90 memo from RTI to EPA, Emission Standards Division, Re: Fiber Release Potential of Nonfriable Asbestos Materials During Demolition and Renovation, at 9 (Exh. 4).)

The OSHA and EPA assessments are consistent with those of the PD Claimants' own experts in these cases. Dr. Arthur Frank, a medical expert for the PD Claimants, testified that

with proper maintenance and handling, he would advise building occupants that the asbestos risk from floor tile "should not be one that is very great." (Frank Dep. at 49.) Likewise, the PD Claimants' expert William Ewing has conceded that "[w]hen left in place, well maintained and undisturbed, these asbestos floor tile and mastic combinations perform their function well without posing a significant asbestos exposure hazard." (*See* June 28, 2002 Class Certification Hearing Tr. at 69-70; William Spain, et al., "Asbestos Floor Tile Removal," *Asbestos Issues '89* (September 1989), at 71-83 (Exh. 5).)

Today, no regulatory agency in the United States -- state, federal or local -- requires a property owner to remove or replace floor coverings in good condition due to an asbestos hazard. Furthermore, to the extent that a property owner believes there may be an asbestos hazard from some activity in connection with floor products, the accepted regulatory response is to conduct appropriate air monitoring of asbestos. As set forth below, no regulation adopts the settled dust method to make such a determination, and no property owner would reasonably rely on dust testing, without air monitoring, because it is an inherently unreliable test, the results of which are impossible to interpret.

III. The Settled Dust Method Is Not Admissible Under Fed. R. Evid. 702 To Establish Property Damage From Flooring Containing Asbestos.

Under Rule 702, expert testimony must be based on a scientifically reliable methodology. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589 (1993). To determine whether an expert's methodology is reliable under Rule 702, the court must evaluate that methodology against a multifactor test. *Elcock v. Kmart Corp.*, 233 F.3d 734, 745 (3d Cir. 2000).[6] The court

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6 Those factors include: (1) whether the methodology consists of a testable hypothesis; (2) whether the method has been subject to peer review; (3) whether the methodology possesses a known or potential rate of error; (4) whether there are standards controlling the technique's operation; (5) whether the methodology has been

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must then determine, through application of those factors, whether the methodology relied upon gives the expert "good grounds" to offer the proposed testimony. *Daubert*, 509 U.S. at 590.

As the proponents of the settled dust method, the PD Claimants bear the burden of establishing the admissibility of their experts' testimony under *Daubert*. *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994) (plaintiffs must demonstrate by preponderance of evidence that their experts' opinions are reliable). In conducting the hearing, the Court is not bound by the rules of evidence except those with respect to privileges. Fed. R. Evid. 104(a) (Court "is not bound by the rules of evidence" in making determinations on admissibility of evidence); *see Daubert*, 509 U.S. at 592-93 and n.10 (trial judge must determine, pursuant to Fed. R. Evid. 104(a), whether the methodology is scientifically valid or properly can be applied to the facts in issue).

A. The PD Claimants Must Establish That Flooring Products Present A Significant Risk Of Disease Caused By Asbestos.

Under *Daubert*, the proponent of a scientific method must show that it has the requisite "fit" for the legal and factual issues in the case, *i.e.*, that it will "assist the trier of fact to understand the evidence or to determine a fact in issue." *United States v. Mathis*, 264 F.3d 321, 334 (3d Cir. 2001), *cert. denied*, 122 S.Ct. 1211 (2002). With respect to the PD Claimants' claims, the "fact in issue" is whether flooring products manufactured by AWI release respirable fibers into the air in sufficient amount to pose a significant risk of disease so as to require abatement through removal of the flooring. As counsel for the PD Committee has conceded, the PD Claimants must show "[p]roof of contamination plus risk of harm" to sustain their claims

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generally accepted; (6) the relationship of the methodology to other methodologies which have been established to be reliable; (7) the qualifications of the expert witness testifying based on the methodology; and (8) the non-judicial uses to which the methodology has been put. *Elcock*, 233 F.3d at 745-46.

against AWI. (March 1, 2002 Hearing Tr. at 70.)[7] Or, as framed by this Court, the issue is "whether over time" a floor covering product can "actually release asbestos in sufficient quantities to potentially injure someone thereby creating property damage because it must be removed or it must be covered up." (July 19, 2002 Hearing Tr. at 33.) *See also* Restatement (Third) of Torts: Products Liability § 21 (1998). Accordingly, any test methodology employed by the PD Claimants in support of their claims must meaningfully -- and reliably -- address that issue.

B. In Order to Pose a Significant Risk of Harm, Asbestos Fibers Must Be Airborne and of Respirable Size.

There is no dispute between the parties that asbestos fibers "must be in the air to pose a health problem." (EPA Response at 4 (Exh. 1); Millette Dep. at 96-97; Frank Dep. at 88-89.) Thus, walking on asbestos fibers does not cause cancer or asbestosis, but inhaling respirable asbestos fibers from the air can cause those diseases if a sufficient number of respirable asbestos fibers are inhaled over a sufficient period of time.

It thus comes as no surprise that scientific inquiry and regulatory standards have focused on the behavior of asbestos fibers in air, including the sizes of fibers that are respirable, and the relative toxicity of different asbestos forms and fiber sizes as found in the air. For example, OSHA regulations determine whether work-place exposures to asbestos are acceptable by reference to the permissible exposure limit, or PEL, which is expressed in terms of a time-weighted average concentration of asbestos fibers of a certain size (longer than 5 microns, with a

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[7] The only court to have confronted the specific question of non-friable asbestos floor tile has concluded that the mere presence of asbestos in floor tile -- that it "may have been subject to forces which may have caused a release of asbestos fibers which may have contaminated" a building -- is not enough. *Adams-Arapahoe Sch. Dist. No. 28-J v. GAF Corp.*, 959 F.2d 868, 874 (10th Cir. 1992) (reversing jury trial award of damages to property owners against manufacturers of flooring products).

length at least 3 times the width of the fiber), in air. *See* 29 C.F.R. § 1910.1001 (OSHA regulation concerning workplace asbestos exposure levels); *see also* 40 C.F.R. § 763.90(i) (EPA regulation pursuant to AHERA to establish clearance of an area that has been abated). By contrast, no regulatory standard relies on measurements of asbestos in settled dust to determine hazard.

C. Air Monitoring Is The Generally Accepted Method For Evaluating Hazard To Humans From Asbestos Because The Risk Of Disease Arises From Inhalation Of Respirable Airborne Asbestos Fibers.

In evaluating whether a test method is appropriate for use in litigation, a court must consider whether there are alternative methods that are better suited to the issue at hand. *See In re Paoli,* 35 F.3d at 742 n.8 (*Daubert* factors include "the relationship of the technique to methods which have been established to be reliable.") For asbestos exposure, it has long been established that air monitoring is the most suitable method for determining the airborne concentration of respirable asbestos. *See, e.g.*, 29 C.F.R. § 1910.1001 (OSHA air monitoring requirements); 40 C.F.R. § 763.90(i) (EPA air monitoring requirements for clearance of asbestos abatement project); EPA Response (Exh. 1) (explaining use of air monitoring at World Trade Center disaster site). Furthermore, institutional PD Claimants such as the State of Illinois and LAUSD have routinely used air monitoring to evaluate asbestos exposure in their buildings. (Broadfield Dep. at 27; Kerst Dep. at 42-43; Anderson Dep. at 35-36; Henry Dep. at 39-40.) Indeed, as noted above, when Mr. Ewing reported elevated "settled dust" levels at the University of Illinois at Champaign-Urbana, the University's safety officer conducted air monitoring to see if there really was a hazard, and concluded there was not. (Kerst Dep. at 85-90.) Air monitoring is accepted as the means of evaluating health risk for the precise reasons that the settled dust method should be rejected.

First, air monitoring is generally accepted for assessing asbestos exposure because it is capable of directly measuring the asbestos fibers that exist in air. An air monitoring device will typically take in a known quantity of air, over a known period of time, and deposit the fibers from the air onto a filter. The filter can then be examined directly under a microscope, and the asbestos structures captured on the filter can be counted under procedures that have been developed to identify those fibers that are respirable. The resulting count is fairly simply translated into an index of the concentration of asbestos structures or fibers in a given volume of air, usually a cubic centimeter.[8] This allows air monitoring data to be evaluated in light of the regulatory and scientific standards noted above.

Second, air monitoring does not destroy or alter the morphology of the fibers that it collects. Both phase contrast microscopy and direct transmission electron microscopy (either of which are called for by regulatory standards in different circumstances) measure the number of fibers collected on the filter without subjecting them to "indirect" preparation methods that can alter their morphology. As demonstrated below, the same claim cannot be made by the settled dust method, which dramatically alters the morphology of the asbestos fibers it collects, preventing the expert from knowing what was in the latent sample when it was collected, but before it was analyzed.

Finally, air monitoring has certain advantages of practicality and flexibility that make it perfectly suited to measuring building contamination.[9] It can be conducted during a particular

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8 If the reporting is fibers per cubic centimeter, it will usually be expressed as "f/cc^3"; if the reporting is asbestos structures per cubic centimeter, it will usually be expressed as "s/cc^3".

9 Air monitoring analysis techniques are also less expensive than those required for dust sampling. For example, laboratory price lists for asbestos testing, supplied by Mr. Ewing, quoted standard rates of $100/sample for dust sampling analyzed by TEM, compared to rates ranging from $15 - $25/sample for air monitoring analyzed by

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activity using personal air samplers (literally attached to an individual, near the breathing zone, while that individual goes about an activity), or it can be conducted in a particular place, using stationary area samplers. (Health Effects Institute -- Asbestos Research, "Asbestos in Public and Commercial Buildings: A Literature Review and Synthesis of Current Knowledge," at p. 4-15 (1991) (Exh. 6).) It can also be done for a short period to measure peak exposures during an activity, or it can be done over long periods of time to obtain time-weighted averages. (*Id.*. at 4-16) In short, air monitoring is the "gold standard" against which any other methodology must be measured.

D. The Settled Dust Method Is Not A Scientifically Reliable Measure Of The Concentration Of Asbestos In Dust, Especially With Respect To Floor Products.

Given the obvious strengths and benchmarks associated with air monitoring, it is noteworthy that the PD Claimants seek to present an alternative form of proof. In contrast to air monitoring, the settled dust method cannot aid the finder of fact to determine the issue of contamination. The settled dust method is both unreliable and ill-fitted to the task which the PD Claimants have assigned it.

As described below, the settled dust method has two parts: collection and analysis. Each part introduces tremendous potential error and bias, the rate of which is unknown, into the test and makes it unreliable for all but the crudest of uses. Furthermore, the test method is particularly unsuitable to "dust" abraded from a floor tile because it uses solvents and procedures that will dissolve the vinyl or asphalt matrix contained in such "dust," thereby altering the particle count for such materials. For these reasons alone, the dust method is not even a reliable

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polarized light microscopy (as permitted by OSHA). (June 28, 2002 Class Certification hearing, Transcript of Proceedings, Testimony of William Ewing, at 68.)

measure of the respirable asbestos in dust, much less air, and thus fails to pass muster under *Daubert*.[10]

1. The settled dust method as adopted by the ASTM has limited use that does not include evaluation of the "safety or habitability" of buildings with asbestos.

The PD Claimants' theory underlying their claims is that the existence of asbestos fibers in settled dust inside a building can establish "contamination" from floor products because the dust may be re-entrained into the air by normal activity and then inhaled by occupants of the building, or custodial and maintenance workers in the building, thereby constituting a hazard. The PD Claimants argue that the settled dust method serves as the scientific method that allows them to make this showing.[11]

In 1989, the American Society of Testing and Materials ("ASTM") began to evaluate a method for measuring asbestos in settled dust. (Ewing Dep. at 3.) ASTM operates through committees, which are in turn further sub-divided into sub-committees. The committee with jurisdiction to evaluate the settled dust method was ASTM Committee D 22 "Sampling and Analysis of Atmospheres." Sub-committee D 22.07 focuses on "Sampling and Analysis of

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10 To date, no court, state or federal, has addressed the admissibility of the settled dust method in a case involving floor products. Furthermore, to AWI's knowledge, no federal court has addressed the admissibility under *Daubert* of the settled dust method in an asbestos property damage case involving any asbestos containing product. One state court in Texas, however -- which uses the *Daubert* standard -- has rejected the settled dust method as a means to evaluate airborne exposures to asbestos in a case not involving floor products. *See In re Lamar County Asbestos Litig.*, slip op. at 7 (Lamar Cty., Texas July 5, 2001). There, the court rejected plaintiffs' attempts to introduce testimony based on the settled dust method as a means of demonstrating elevated airborne concentrations. *Id.* The Court also criticized the affidavit offered by Dr. James Millette in that case as well as his videotaped deposition testimony, characterizing it as "consistently evasive and disingenuous at best" and noting that his opinions lacked "proper scientific corroboration, explanations, and annotations." *Id.* at 12.

11 The PD Claimants have proffered two experts in support of the settled dust method: Dr. James Millette, a microscopist who has analyzed dust samples and worked on procedures to standardize the method, and Mr. William Ewing, a certified industrial hygienist who has collected dust samples and also worked on procedures to standardize the method.

Asbestos." From 1989 to 1995, sub-committee D 22.07 found itself embroiled in controversy over the utility and significance of the proposed settled dust method.[12] (*Id.* at 5) Finally, in 1995, the settled dust method was approved, but only after the "significance and use" section of the method was qualified to make clear that "*a single direct relationship between asbestos-containing dust and potential human exposure does not exist" and that the test "does not describe procedures or techniques required to evaluate the safety or habitability of buildings with asbestos-containing materials.*" (*Id.* at 81; ASTM D 5755-95 at § 5.1.1-5.1.2 (cited hereafter as the "ASTM Method") (emphasis supplied) (Exh. 7).)[13] The method is designated as ASTM D 5755-95 -- "Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations."

The ASTM Method begins with collection of a sample of dust from a known surface area (usually 10cm x 10cm) using a special microvacuum that is connected to the same type of "cassette" used to collect samples in air monitoring. (ASTM Method at §§ 8.1-8.8.) The sample is analyzed using the "indirect preparation" method of examining a specimen through transmission electron microscopy (TEM). (*Id.* at §§ 104.-15.5.) Notably, the indirect method requires that the material collected by the microvacuum on the original filter be washed, put into an acidic solution, shaken, sonicated (bombarded by high energy sound waves), diluted, and then distributed on a new filter for reading under a microscope. As discussed below, this method

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12 AWI's expert, Roger Morse, served on the subcommittee during this period of time, as did the PD Claimants' experts William Ewing and James Millette. AWI expert Bert Price joined the subcommittee after the dust method was first approved.

13 ASTM states that "[i]t is the user's responsibility to make" determinations about safety or habitability. (ASTM Method at § 5.1.1.) Significantly, the PD Claimants' experts disagree on who "the user" is: Mr. Ewing says it is the consultant, such as himself, who ordered up the dust test (Ewing Dep. at 82-83); Dr. Millette says it is the property owner (Millette Dep. at 123-124).

alters the material that was collected, and thus has significant disadvantages compared to the "direct" method of TEM analysis, used in air monitoring, which examines the specimen as it was collected on the initial filter.

2. The Settled Dust Method Does Not Result In A Scientifically Reliable Measure Of The Concentration Of Respirable Asbestos Structures On A Surface.

Under *Daubert*, a court must examine whether a proffered methodology is reliable, including whether it possesses a "known or potential rate of error," and whether there are "standards controlling the technique's operation." *Elcock*, 233 F.3d at 745. The settled dust method, however, lacks adequate controls in certain critical respects and is thus subject to tremendous variability in the collection stage. While the rate of error due to this variability is unknown, the likely range of error for dust sample results is so large as to render the data virtually meaningless, especially for analysis of material that may have been abraded from floor products. The analysis of dust samples with the indirect TEM method compounds the error from sampling by biasing the asbestos structure counts upwards, but again to a degree that is unknown.

(a) The Dust Collection Process Injects Large, Unknown Degrees Of Variability Into Reported Concentrations Of Settled Dust.

The process for obtaining a dust sample is rife with variables for which there is no control, each of which tends to introduce unquantified error into the results. Significantly, the "dust" that accumulates on a surface may contain a complex mix of materials and layers with different characteristics. For example, very small particles (less than 2 microns) tend to have a strong electrostatic attraction to most surfaces. (Millette and Hays, *Settled Asbestos Dust Sampling and Analysis* at p. 59 (Exh. 9); Millette Dep. at 146-147 (small particles unlikely to be reentrained).) Other particles may interact with each other to form clusters on a surface.

(Millette Dep. at 80-83.) It is important to bear in mind that the "settled dust" method *does not* attempt to collect and analyze *all* of the asbestos that adheres to a surface[14] -- instead, it is intended to analyze only that portion of the dust that, in theory, can be re-entrained[15] into the air. (Millette Dep. at 147.) The problem, however, is that the factors listed below will affect the efficiency with which dust on a surface is collected for analysis and introduce tremendous variability into the sample collection process:

1. Surface texture. Dust can be collected more efficiently from a smooth or glossy surface than from a textured, dirty, sticky, tacky, grooved or cracked surface. (*See, e.g.*, Millette and Hays, *Settled Asbestos Dust Sampling and Analysis*, at 85 ("[s]ample collection efficiencies vary with surface types") (Exh. 9).)

2. Cleaning history. A surface that has been cleaned recently will generally have less dust than one that has not been cleaned for some period of time. While a dirty surface may generate more dust for collection, the interaction of particles with each other on a dirty surface will be different than on a relatively clean surface. (*See, e.g., Id.* ("to avoid biased data when sampling" one must know whether a surface "has recently been cleaned."))

3. Nonrandom distribution. Dust does not distribute on a surface -- especially a floor -- in a random fashion. Instead, dust accumulates in corners and along baseboards, around obstructions, and in cracks. (*See* Millette Dep. at 76-77; Ewing Dep at 122-123) Accordingly, the selection of a sampling site within a room can greatly bias the results.

4. Nozzle velocity. The "face velocity" of the nozzle on the microvacuum used to collect the sample introduces tremendous variability into the results. In one "side-by-side" comparison of results using two different microvacuums, the PD Claimants' expert Mr. Ewing reported differences as great as 100 times more "asbestos structures" with one vacuum than the other, but the results were not very consistent.

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14 Other methods exist that will collect a much higher percentage of the material that is on a surface, including "wipe samples," which will pick up material adhered to the surface. (*See, e.g.*, Ewing, "Further Observations Of Settled Asbestos Dust In Buildings," *Advances In Environmental Measurement Methods For Asbestos,* ASTM (2000) at 330 ("wipe samples probably have the highest collection efficiency from non-porous surfaces and provides [sic] a measure of total asbestos surface dust concentration.") (Exh. 8).)

15 "Re-entrained" means to take a particle that was in the air, but has settled, and put it back into the air. This is not an appropriate term for describing material abraded from a floor product that is then found on the surface of that product, as it may never have been in the air in the first place.

(*See* William M. Ewing, "Further Observations of Settled Asbestos Dust in Buildings," *Advances in Measurement Methods for Asbestos*, at 329, Table 4 (Exh. 8).)

5. Collection technique. If the technician taking the sample brushes the tip of the microvacuum nozzle across the surface, he or she may liberate through friction particles that are adhered to the surface. Because technicians are inconsistent in whether they touch the surface, this also results in variability between technicians, and even with one technician between different samples.

Significantly, no study has been published on the extent of variability introduced by these factors, either singly or in combination. Mr. Ewing conceded in his deposition, however, that the error range for settled dust results was as much as one order of magnitude (Ewing Dep. at 95, 103), *i.e.*, that a reported result of 100,000 structures of asbestos (per square centimeter) could be as low as 10,000, or as high as 1 million. But even that estimate is too low, because Mr. Ewing's own published side-by-side comparison of dust sample results with two different microvacuums showed variability of up to more than two orders of magnitude -- a 100-fold difference -- without any pattern of consistency. (William M. Ewing, "Further Observations" at 329, Table 4 (Exh. 8).) For example, one side-by-side test resulted in 17,000 s/cm^2 with the first sample, and 140 times that value, or 2.4 million s/cm^2, for the second sample. (*Id.*) AWI's expert, Mr. Morse, has stated that "[t]he variability is wild" in the dust method, due to "a lack of precision and unreconciled bias in the testing method," and he will testify that the confidence interval for dust results is approximately two to three orders of magnitude. (*See* Morse Dep. at 27-28.)

Finally, the dust method fails to account in any way for "background" levels of asbestos in dust, which are not insubstantial, or alternative sources of asbestos in a building, such as fireproofing or insulation. Indeed, Mr. Ewing has reported concentrations of asbestos in dust *outside* of buildings in one large city that ranged from below the limit of detection to as high as 140,000 s/cm^2. (*See* Ewing, "Observations Of Settled Dust In Buildings," EIA Technical Journal

(Summer 1996) at 14 (Exh. 10).) Furthermore, the videos of dust collection in Illinois clearly show instances of likely contamination of a floor surface with asbestos containing material from other sources.

Significantly, the range of error in the collection process and the background level of asbestos in dust both overwhelm Ewing's own "scale" for determining whether the reported concentration of asbestos structures in a dust sample is significant. Ewing believes that concentrations of 1000 s/cm^2 or less mean a surface is "clean," whereas 10,000 s/cm^2 is "low;" 10,000-100,000 s/cm^2 is "moderate," and over 100,000 s/cm^2 is "high." (Ewing Dep. at 86; *see also,* Ewing, "Further Observations" at 330 (Surface is "clean" below 1000 s/cm^2 and "contaminated" over 100,000 s/cm^2; in between these values "requires professional judgment by the investigator") (Exh. 8).)[16] It is readily apparent, however, that Ewing's entire scale falls within either or both of (i) the order of magnitude (or more) margin of error for the dust method and (ii) the known background levels of asbestos structures in settled dust, which by itself can exceed 100,000 s/cm^2. In short, the settled dust method flunks *Daubert* at the collection stage alone.

(b) The Indirect TEM Analysis Method Alters The Asbestos Structures Collected In Dust And Biases The Reported Concentrations.

Further compounding the difficulties posed by the collection of settled dust, the indirect TEM method of analysis also injects a clear bias into data generated by the settled dust method. "Direct" TEM analysis allows a microscopist to examine a sample taken directly from the filter on which the specimen was originally collected, without altering the material on the filter. This

16 Ewing concedes that this scale is not based on any epidemiological or medical data. (Ewing Dep. at 87.)

method has been accepted by both EPA and the National Institute for Occupational Safety and Health. *See* 40 C.F.R. § 763.90(i) (EPA regulation requiring AHERA clearance levels to be analyzed via TEM); NIOSH 7400, 7402 (direct TEM method). By contrast, the indirect method (which is not approved for any regulatory purpose) involves analysis of a second filter after the settled dust sample has been processed from its original filter, which changes the material collected.

The primary problem with the indirect method is that the processing of the sample taken from the initial filter alters the morphology of the asbestos structures that one is attempting to count. (Millette Dep. at 138.) In particular, washing the filter, adding acid, shaking the sample and especially sonicating it all tend to disaggregate the structures as collected on the filter originally, and thus increase the asbestos structure counts. (*See* Millette Dep. at 57-67; *see also* EPA, "Comparison of Airborne Asbestos Levels Determined By Transmission Electron Microscopy (TEM) Using Direct and Indirect Transfer Techniques," at 33 (March 1990) (Exh. 11).) Moreover, the extent of variability introduced by these processing steps is itself variable, such that it is impossible to compare a count from the indirect method to one from the direct method. (*See id..*, at 3 ("no single factor can be applied to convert measurements made using an indirect method to a value that is comparable with measurements made using a direct transfer method.").) What is known, however, is that the indirect method biases structure counts upwards -- indeed, in a study for the EPA, researchers concluded that asbestos structure counts from the indirect method ranged from 3.8 to 1700 times higher then the structure counts found in samples analyzed by the direct method. (*Id.* at 3.)

Another significant problem with the indirect method is the need, with some samples, to make "serial dilutions" of the sample. As a rule, the more particulate matter in a sample

(regardless of whether it is asbestos) the more dilutions will be needed to get a sample suitable for analysis under TEM. (ASTM Method at § 10.4.9; Morse Dep. at 170.) As AWI's experts, Dr. Price and Mr. Morse, have testified, each dilution increases the range of error in the reported results. (Morse Dep. at 170, 180; Price Dep. at 316.) Serial dilutions pose a particular problem of "false negatives," *i.e.*, that a sample reported as "clean" by Mr. Ewing's standards would, in fact, be "dirty." (Price Dep. at 316-320.)

Moreover, there is a significant range of interlaboratory error in reporting results under the settled dust method. Dr. Millette submitted controlled dust samples[17] to a group of laboratories for a "round robin" of testing to see how close the results were, and found variation of as much as 196%. (Millette Dep. at 88; James Millette, Draft Precision and Bias Statement for ASTM D 5755-95 at 1 (Exh. 12).)

Further, the settled dust method itself as passed by ASTM is required to have a statement of both its level of precision and its level of bias. (Millette Dep. at 43-44.) At this time, however, the ASTM Method's precision statement states only that the "precision of the procedure in this test method is being determined," while the bias statement states only that because "there is no accepted reference material suitable for determining the bias of the procedure in this test method, bias has not been determined." (ASTM Method at § 21.2 - 21.3.) Dr. Millette testified that at times a method may be passed with a precision and bias statement indicating that the method's precision and bias are under study, but that it was expected that within about seven years, the method would have a more complete precision and bias statement. (Millette Dep. at 44.) But Dr. Millette conceded that even now, more than seven years after the

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17 These samples were taken from the second filter, *after* processing, and thus the interlaboratory results do *not* account for variability caused by the processing.

ASTM Method passed, the ASTM committee responsible for passing the settled dust method is not satisfied that sufficient data exist to create a proper precision and bias statement for that method. (Millette Dep. at 45.)

In short, the indirect TEM analysis specified by the settled dust method alters the material as collected and adds a further, unquantified, range of variability to a test that is already fatally flawed at the collection and sampling stage. The unquantifiable bias introduced by the indirect TEM process, standing alone, is another independent reason the dust method flunks *Daubert*.

3. The Settled Dust Method Is Particularly Unsuited For Analysis Of The Unique Material That May Have Been Abraded From A Floor Product.

Quite apart from the large variability inherent in the settled dust method generally, floor products present certain unique characteristics that make this method particularly unsuited to application in a case involving such products. First, floor tile, when abraded, tends to release particles that include the vinyl matrix material.[18] These particles are then "pushed" to the sides and corners of a space, along the tops of the floor, without ever having entered the breathing zone. (Ewing Dep. at 123; *see also* Millette Dep. at 180-181.) Indeed, debris from floor tiles has not necessarily *ever* been in the breathing zone, in contrast to asbestos structures that fall from fireproofing or that are distributed in a building's ventilation system. (*Id.*)

To the extent that material from flooring is "pushed" to an area that is regularly maintained, it will either be cleared away during cleaning, or encased in the wax layer on the floor. (Millette Dep. at 172 (cleaning clears area of asbestos fibers); Ewing Dep. at 161-162

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[18] To the extent that individual asbestos fibers are released from floor tile, they tend to be small -- generally 2-3 microns in length. The shorter of these fibers -- those of 2 microns or less -- will have a strong electrostatic attraction and adherence to the surface. Millette and Hays, *Settled Asbestos Dust Sampling and Analysis*, at 59.

(wax layer minimizes fiber release).) On the other hand, if the material from a floor is "pushed" into a dirty corner that is obstructed from cleaning, it may accumulate -- but without necessarily getting into the air. Samples taken from such corners -- as occurred in dust sampling conducted by Mr. Ewing for PD Claimant the State of Illinois[19] -- will not be representative of the overall surface and can bias the reported results tremendously. (*See, e.g.*, Ewing Dep. at 123; s*ee also* Morse Dep. at 28-29 ("the concentration of dust at the perimeter of the room is greater than it is at the center of the room").) Accordingly, it is not possible to take a "random" dust sample of material abraded from a floor surface, and no one has suggested a procedure or formula for overcoming this problem.

Second, the use of any TEM method of analysis (direct or indirect) on material from floor tile presents a unique problem because "the solvents used in the preparation dissolve the vinyl polymer or asphalt, releasing a great number of asbestos fibers from each particle." (Health Effects Institute -- Asbestos Research, "Asbestos in Public and Commercial Buildings: A Literature Review and Synthesis of Current Knowledge," p. 4-71 (1991) (Exh. 6).) Accordingly, "[a]sbestos structure counts made on . . . TEM specimens [from floor tile] are very difficult to interpret, because the TEM specimen preparation itself causes the generation of a large number of asbestos structures from each particle of floor tile debris present on the original filter." (*Id.* at 4-71.) Moreover, this floor tile specific problem becomes magnified with the *indirect* TEM analysis specified in the settled dust method, which introduces an acidic solution that dissolves vinyl and asphalt, as well as the other TEM processing steps that facilitate dissolution of the vinyl and asphalt matrix. Accordingly, "floor tile debris presents special problems of

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19 AWI will introduce at the hearing a videotape from the Illinois testing done by Mr. Ewing showing this type of phenomenon.

interpretation, since the use of indirect methods . . . can result in high asbestos structure counts *not representative* of the material" as it was collected. (*Id.*, emphasis supplied.)

This problem in analyzing samples from floor tile is illustrated by an experiment performed by Dr. Eric Chatfield, a well-regarded scientist in the field of asbestos exposure, in which he abraded a floor tile with a scalpel, taking dust measurements alongside of air measurements. The air measurements were examined under both direct (ISO 10312) and indirect (D5755-95) sampling techniques. While the direct sampling found few chrysotile structures and no isolated chrysotile fibrils or fiber bundles, the indirect sampling method yielded far more chrysotile structures, most of which were single fibrils of chrysotile. (Eric J. Chatfield, "Correlated Measurements of Airborne Asbestos-Containing Particles and Surface Dust," *Advances in Environmental Measurement Methods for Asbestos*, at 385-387 (Exh. 14).)

In short, debris abraded from floor tile presents unique problems that render the method particularly unsuitable to application in any context involving an estimate of the concentration of asbestos structures on a surface due to abrasion of a floor product. For this reason alone, the settled dust method should, at a minimum, be excluded from any property damage proceeding involving a flooring product.

E. The Settled Dust Method Does Not "Fit" Because It Cannot Project The Concentration Of Respirable Asbestos That Is, Or Will Be, In Air.

In addition to issues surrounding its reliability, the settled dust method also lacks the requisite "fit" to the legal and factual issues in the litigation. As the Third Circuit has noted, Rule 702 requires, in addition to adequate qualifications and methodology, that the proffered expert testimony "assist the trier of fact to understand the evidence or to determine a fact in issue." *Mathis*, 264 F.3d at 334. Even if an expert's proposed testimony constitutes scientific

knowledge based on a reliable methodology, it will be excluded under the fit requirement if it is not scientific knowledge "for purposes of the case." *In re Paoli,* 35 F.3d at 743.

Here, the settled dust method does not fit because, unlike air monitoring, it cannot establish whether respirable asbestos fibers are or can become airborne -- as they must be to pose a threat to human health. The settled dust method tells the user nothing about what is in the air, nor does it tell the user about what is likely to get in the air. Its own significance and use section concedes that there is no known "single direct relationship between asbestos containing dust and potential human exposure . . ." and that the method is not suitable to "evaluate the safety or habitability of buildings with asbestos containing materials." (ASTM Method at § 5.1.2.) Because the method does not measure health risk, it cannot be used to establish "contamination."

The EPA has noted the absence of a scientifically valid relationship between settled dust data and air samples. As it explained recently in connection with clean-up of the World Trade Center disaster site:

> We realize that there may be asbestos in the dust in residential units and that some of this asbestos containing dust may get disturbed and become airborne. But we don't have broad scientific agreement on the relationship between what is in the dust and what is in the air. For example, how much settled dust can be disturbed and become airborne is affected by the amount of dust, the nature of indoor activity, the air flow rates in different interior spaces and the rate that the dust re-settled. Because of these variables, there is no health-based level that we can use for dust.[20]

Attempts by the PD Claimants' experts to correlate settled dust results and air samples have failed. That failure was nowhere more evident than when the parties put the two methods to the test in side-by-side situations. AWI's expert collected air samples simultaneously with

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20 EPA Response at 4-5 (Exh. 1).

Mr. Ewing's collection of dust samples from the State of Illinois' buildings. The air samples were collected on personal monitors worn by AWI's expert witness Roger Morse and his staff while observing Mr. Ewing's dust sampling. (Expert Report of Roger Morse at 32-33.) Regardless of the dust sampling results -- high or low -- the air monitoring results were uniform -- no asbestos structures were detected under the NIOSH direct TEM method number 7402, and all of the results were below the OSHA permissible exposure limit. (*Id.*)[21]

Even rudimentary studies of the relationship between asbestos in dust and in air conducted by Dr. Millette have shown a several thousand-fold difference in results -- at least three orders of magnitude -- under different conditions. (Kelman and Millette, et al., "Resuspension of Asbestos in Settled Dust in an Apartment Cleaning Situation, *Applied Occupational & Environmental Hygiene*, at 877 (Nov. 1994) (showing range of "K factors" between $4x10^{-3}$ and $3x10^{-6}$) (Exh. 13).)[22] Although these studies lack rigor or adequate controls, they nonetheless demonstrate the tremendous variability that can come into play due to such factors as the level of activity, the location of the dust, airflow rates, and settling rates. Because the amount of dust re-entrained by a particular activity is dependent on a host of unstudied factors -- including room size, ventilation level and type, and room activity -- Dr. Millette conceded in his book that "[t]he basic principals governing the resuspension of small particles

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21 PD Claimants complain about AWI's use of NIOSH methods 7400 and 7402 to analyze the Illinois air samples, but Illinois' own safety personnel used the same standards when *they* conducted follow-up air monitoring in response to the dust results reported by Mr. Ewing for the litigation. (*See* Kerst Dep. at 86-90.)

22 Dr. Millette's attempt to develop a "K factor," which would translate a concentration of settled dust on a surface into a concentration of asbestos structures in air, is based on an analogy to the field of nuclear radiation, where K factors represent a well-developed, scientifically reliable method employed by experts to assess radiation exposure. *See In re TMI Litig.*, 193 F.3d 613, 637 (3rd Cir. 1999) (explaining K-factors in radiation exposure context). In stark contrast to the scientifically accepted K-factors in the radiation context, Millette has conceded that "[w]e're not at the point with the K-factor calculation to be able to say that if you've got this level in the dust, you're going to have this level in the air." (Millette Dep. at 182-185.)

and dust are complex and not well understood." (Millette Dep. at 182-185; *see also* Millette and Hays, *Settled Asbestos Dust Sampling and Analysis*, at 85) (Exh. 9).) Similarly, Mr. Ewing has stated that "[a]dditional research" is needed on "the relationship between specific activities and concentrations of asbestos in dust," particularly "the amount of air movement and turbulence necessary to re-entrain dust from a surface." (Ewing, "Further Observations" at 331 (Exh. 8).) There is thus no reliable methodology upon which to draw human exposure conclusions from settled dust data generally.

In any event, no one has demonstrated that there *is* a relationship between "dust" constituting debris abraded from floor tiles and airborne concentrations of such "dust." None of the rudimentary studies conducted or reviewed by Dr. Millette was of material from any floor product containing asbestos.[23] Furthermore, because any abraded material from a floor product tends to get "pushed" to the sides and corners of a room -- out of the air circulation -- and tends still to include pieces of vinyl or asphalt matrix, it is reasonable to conclude that such material would generally *not* become airborne, and would generally not *stay* airborne if a tremendous source of energy nonetheless forced it into the air.

The data bears out this expectation that "dust" from floor tile does not become airborne to any significant degree. In Dr. Chatfield's experiment abrading floor tile with a scalpel, discussed above, he found that the airborne "dust" from abraded asbestos-containing floor tile contained only vinyl-asbestos matrices. Dr. Chatfield found *no* free asbestos fibers or asbestos bundles in those air samples. (Chatfield, "Correlated Measurements" at 385-387 ("Only 4 chrysotile

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23 For expert testimony to be admissible under *Daubert*, it requires more than "haphazard, intuitive inquiry." *See Oddi v. Ford Motor Co.*, 234 F.3d 136, 156 (3d Cir. 2000), *cert. denied*, 532 U.S. 921 (2001) (excluding expert's testimony regarding alternative design because he never tested it).

structures were detected during examination of 45 grid openings of the TEM specimens prepared by direct-transfer, and all of these particles were matrices.") (Exh. 14).) Similarly, Mr. Ewing conducted an experiment in which he abraded floor tile with a chair leg while collecting an air sample, and concluded that fiber release from furniture abrasion did not cause a significant increase in the airborne concentration. (Ewing Dep. at 136.)

In short, the PD Claimants have given the Court no good reason to measure dust rather than air, and the method they have proffered does not provide a scientifically reliable bridge between the two.

F. The Settled Dust Method Has Not Been Generally Accepted To Evaluate The Hazard Of Asbestos To Building Occupants Or Workers.

Under *Daubert,* whether the scientific community generally accepts a proffered methodology is one of the factors the court must evaluate in determining reliability. *Daubert,* 509 U.S. at 594. As the *Daubert* court noted:

> Widespread acceptance can be an important factor in ruling particular evidence admissible, and "a known technique which has been able to attract only minimal support within the community," [citation omitted] may properly be viewed with skepticism.

Id.

Not surprisingly, due largely to the problems of variability and interpretation discussed above, as well as the widespread availability of reliable air monitoring methods, the settled dust method has attracted "only minimal support" in the scientific community. The method has not been adopted by any regulatory agency or incorporated into any regulatory standard.[24]

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[24] Significantly, the "non-judicial uses to which the [dust method] has been put," *see Elcock,* 233 F.3d at 746, have been much more limited than that propounded by the PD Claimants here. For example, the EPA has utilized the settled dust method for limited purposes in two isolated instances where it also conducted extensive air monitoring. The first is the Libby, Montana vermiculite mine, where the EPA sought to evaluate amphibole

(Continued...)

Furthermore, the PD Claimants' own expert, Dr. Millette, concedes that the settled dust method, standing alone, is not something that the scientific community would use to determine health risk. (Millette Dep. at 98-99.) Indeed, Dr. Millette could not identify a single situation where any individual had made a decision to remove or cover asbestos containing flooring material on the basis of the settled dust method alone. (*Id.* at 99.) (*See also* Millette and Hays, *Settled Asbestos Dust Sampling and Analysis*, at 83 ("no regulatory standards exist for asbestos in settled dust") (Exh. 9).)

In addition, the PD Claimants' own officials responsible for the safety of building occupants and workers, who have had years of experience monitoring and managing asbestos hazards, have roundly rejected the settled dust method as a legitimate tool for hazard evaluation. For example, the State of Illinois had Mr. Ewing conduct settled dust testing in buildings on the campus of the University of Illinois at Champaign-Urbana. The results of that testing -- done for litigation purposes -- were then provided to Patricia Kerst, a licensed environmental health practitioner who has been a Safety Officer at the University since 1984, and who is the primary contact for asbestos safety issues at the University. Shortly after receiving Mr. Ewing's report, Ms. Kerst wrote a memo to a senior University administrator in which she explained that "[t]here is no regulatory standard for this 'settled dust,'" and that the testing done by Mr. Ewing "is designed to look like a 'big' hazard for the litigation." (Kerst Memo at 1 (Exh. 3); Kerst Dep. at 82.) As follow-up to the Ewing test results, Ms. Kerst did what any responsible asbestos safety

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asbestos contamination via soil, surface dust, and water testing in addition to comprehensive air monitoring. The second was the World Trade Center disaster, where dust testing has been used to determine where debris settled and where cleaning needs to be done, but the EPA has used only air monitoring to evaluate risk. (EPA Response at 10 (Exh. 1).) Other uses cited by Dr. Millette involved only whether to clean a particular area. (Millette Dep. at 27-30.)

officer would do -- she conducted "*air monitoring* in the rooms where Compass [Ewing's company] collected their samples." (Kerst Memo at 1; Kerst Dep. at 85-88) (emphasis supplied).) Because the air monitoring results showed no hazardous levels of asbestos fibers in the air, Ms. Kerst did not recommend that the University remove or replace the flooring in areas tested by Mr. Ewing. (Kerst Dep. at 79.)

Similarly, Russell Broadfield, a 30 year employee of Illinois State University and its manager of asbestos issues for the last decade, had never heard of Mr. Ewing's settled dust method until Mr. Ewing arrived on that campus to perform his litigation-related testing. (Broadfield Dep. at 26.) Mr. Broadfield and his office gave no weight to Mr. Ewing's test results, presumably because they had no idea how to interpret them. (*Id.* at 32.) The testimony of the vast majority of similarly situated employees from sites of Ewing's litigation testing for both Illinois and another PD Claimant, the Los Angeles Unified School District, was in accord with Kerst and Broadfield: they do not use the settled dust method to evaluate whether asbestos in the buildings under their control presents a hazard, and they are unaware of the significance or meaning of data generated by the settled dust method. (Henry Dep. at 31-48; Kish Dep. at 20-21, 47-52; Anderson Dep. at 33-41; Whitlock Dep. at 35-41.) Accordingly, the PD Claimants cannot show that the settled dust method has achieved general acceptance for any purpose, much less for the unique issue of evaluating the potential hazard posed by asbestos in flooring products.

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In sum, the settled dust method is not reliable for reporting the concentration of asbestos in dust to any reasonable degree of accuracy, and it is particularly unsuited to use with floor products due to effects of the indirect TEM method on vinyl and asphalt. Accordingly, on that

basis alone, the settled dust method should be excluded from these cases. In addition, however, the dust method fails the "fit" requirement of *Daubert* because it cannot measure or predict airborne levels of respirable asbestos, which is the relevant exposure. Air monitoring for asbestos is a generally accepted methodology that does fit, and as applied in the State of Illinois context such air monitoring has simply confirmed what the regulatory authorities have said for years: floor products with asbestos are generally safe if managed prudently. Not surprisingly, given its unreliability and unsuitability, the settled dust method has not gained any measure of general acceptance. Accordingly, AWI's motion to exclude evidence from the settled dust method offered by the PD Claimants should be granted.

IV. The Qualifications And Methodologies Of AWI's Experts Easily Satisfy Daubert.

The PD claimants have raised a number of objections to the admissibility of the testimony of AWI experts Roger Morse and Bertram Price. The objections can be divided into two categories: qualifications and reliability/relevancy. As demonstrated below, Morse and Price have the requisite training and experience to assist the trier of fact with scientific and technical issues in these cases, and they have been qualified to testify in courts around the country on numerous occasions. Furthermore, the PD Claimants' objections to various pieces of evidence offered by those experts is not well founded, The PD Claimants' objections should thus be overruled, and their motion denied.

A. The Qualifications Of Experts Morse And Price Are Sufficient On Both Educational And Experiential Grounds.

Under Rule 702, an expert witness may offer testimony if qualified by knowledge, skill, experience, training, or education. Although the expert must possess specialized skill or knowledge greater than that of an average layman, the Third Circuit has held that the basis of this knowledge "can be practical experience as well as academic training and credentials" and has

interpreted the requirement liberally. *See Betterbox Communications Ltd v. BB Techs., Inc.*, 300 F.3d 325, 327 (3rd Cir. 2002) (citing *Waldorf v. Shuta*, 142 F.3d 601, 625 (3rd Cir. 1998) (citations omitted)). Both Morse and Price satisfy these requirements.

1. Roger Morse Is Highly Qualified To Testify About All Aspects Of Testing And Evaluating The Potential Hazards Of Building Materials Containing Asbestos.

Roger Morse will offer opinions regarding the potential hazards of asbestos containing materials in buildings under various conditions, the treatment of such materials by regulatory bodies such as the EPA and OSHA, and the data and testing results submitted by the PD Claimants and their experts. Mr. Morse is qualified to offer these opinions both by his training as an architect (a field which necessarily involves the study and practices relating to the use of building materials such as resilient floor tile containing asbestos) and as an asbestos specialist (holding accreditations in asbestos inspection, management planning and abatement design), as well as by his experience (which includes being the president of Dyanki, Inc., an industrial hygiene and environmental management firm). More specifically, the following examples of training and experience qualify Mr. Morse to offer the opinions specified in his expert report:

- Bachelors of Architecture and Science from Rensselaer Polytechnic Institute.
- Licensed to practice architecture in ten states and the District of Columbia and certified by the National Council of Architectural Registration Boards.
- Membership on the Literature Review Panel, assembled by EPA under the auspices of the Health Effects Institute -- Asbestos Research, which was characterized as "an independent and balanced panel of experts representative of the best scientific and technical expertise."[25]

[25] Health Effects Institute -- Asbestos Research, "Asbestos in Public and Commercial Buildings: A Literature Review and Synthesis of Current Knowledge," (1991) at p. iii (Exh. 6).

- President of Dyanki, Inc., a firm that provides consulting services in the fields of architecture, indoor air quality, forensic investigation, and environmental issues relative to asbestos, toxic materials, indoor air, industrial hygiene, environmental management and analytical laboratory needs.

- Over 30 years experience in the specialized area of asbestos evaluation and control, including specialized training in asbestos from the Mount Sinai School of Medicine, the National Asbestos Training Centers at the Universities of Kansas and Georgia, as well as accreditation in asbestos inspection, management planning and abatement design.

- Numerous presentations to and service on professional committees regarding asbestos issues, including ASTM Subcommittee D 22.07.

- Taught courses in asbestos and building environmental issues at a number of universities including Georgia Tech, the University of Kansas, the University of Illinois, and Tufts University.

- Extensive experience in the regulatory process of rule making and approval, including service on EPA's Science Advisory Board, the U.S. Department of Housing and Urban Development's Healthy Homes Initiative peer review panel, and the select committee convened by EPA to develop the Transmission Electron Microscopy clearance protocol for the AHERA regulation.

- Author of articles and guidance documents on asbestos in buildings including the topic of maintaining asbestos in place as a response action.

Mr. Morse is thus well-qualified to offer testimony on the proffered subjects.

Furthermore, Mr. Morse is particularly well qualified to testify about the limitations on the use of the dust method because he has been charged by the ASTM Subcommittee D 22.07 with drafting a "guidance document" for the method. Both Mr. Ewing and Dr. Millette agreed that Mr. Morse is qualified for this task. (Ewing Dep. at 28; Millette Dep. at 48-49.)

2. Dr. Bertram Price Is Highly Qualified To Testify About The Statistical Precision Of Various Test Methods And The Extent Of Hazard Posed By Various Asbestos Exposures.

Dr. Price will offer opinions regarding the reliability of various methods of measuring asbestos, including the settled dust method, and the extent of risk posed by human exposure to different amounts, forms, sizes and shapes of asbestos. Dr. Price is qualified to testify both by his training as a mathematical statistician as well as his extensive experience in the fields of

environmental regulation, risk assessment, biostatistics, and risk management. More specifically, the following examples of training and experience qualify Dr. Price to offer the expert opinions proffered in his report:

- Ph.D in mathematical statistics from Ohio State University.
- Membership in the American Association for the Advancement of Science, the American Statistical Association, and the Society for Risk Analysis.
- Editor of several of the EPA's well known "Rainbow Books" relating to the regulation of asbestos in schools and other buildings.
- President of Price Associates, Inc., a consulting firm located in White Plains, New York since 1987. Price Associates, Inc. conducts research and provides consulting on environmental regulations, risk assessment, biostatistics and risk management.
- Involvement in the regulatory process leading to asbestos-related rule making, including acting as the discussion leader for EPA panels on asbestos management, assessment, and operations and maintenance, and serving as a peer reviewer for most EPA studies concerning asbestos conducted during the past fifteen years.
- Acting as the principal author of the report to the New York City Department of Environmental Protection on exposure and risk associated with asbestos-containing materials.
- Membership on ASTM Subcommittee D 22.07 -- Asbestos Sampling and Analysis, which is charged with the development of methods for measuring and assessing asbestos exposure (and is the committee which oversaw ASTM D 5755-95).
- Author of numerous articles relating to asbestos.
- Experience from consulting on asbestos exposure, risk, costs, and regulatory issues arising in asbestos property damage litigation as well as provision of expert testimony in underlying property damage and insurance coverage cases.

Dr. Price is thus well qualified as one of the leading experts on asbestos related issues to proffer the opinions set forth in his report.

The Third Circuit has reversed district courts for excluding experts far less qualified than either Mr. Morse or Dr. Price. *See, e.g., Holbrook v. Lykes Bros. S.S. Co.*, 80 F.3d 777, 782 (3rd Cir. 1996) (reversing district court's exclusion of proffered testimony of medical doctor relating

to whether cancer in question was mesothelioma); *In re Paoli*, 35 F.3d at 753 (holding that, although medical doctor was a "relatively poor clinician and less than fully credible witness," the district court nonetheless erred in excluding him as unqualified). As the *Holbrook* court noted,

> it is an abuse of discretion to exclude testimony simply because the trial court does not deem the proposed expert to be the best qualified or because the proposed expert does not have the specialization that the court considers most appropriate.

Holbrook, 80 F.3d at 782. In the instant case, however, Mr. Morse and Dr. Price *do* represent the very best in their fields -- as reflected by the repeated reliance of EPA and other public bodies on their advice and work. Any criticism claimants have as to the qualifications of these two experts are thus better directed to the weight of their testimony rather than its admissibility. *See id.* at 782-83.

B. AWI's Experts' Methods Are Relevant And Reliable.

The PD Claimants' numerous objections to the relevance and reliability of Mr. Morse's and Dr. Price's expert opinions, set forth in their August 2 filing, are without merit.

1. The Specific Asbestos Concentrations in Air, the Aspect Ratio And Length Of Asbestos Fibers As Measured By Phase Contrast Microscopy, And The Conclusions Of The Regulatory Agencies That Have Studied These Issues, Are Clearly Appropriate Subjects Of The Expert Testimony Of Mr. Morse And Dr. Price.

Claimants' objections Nos. 1, 2, 3, 4, and 8 can be answered as a group. They are as follows:

1. Proof of property damage is not dependent upon demonstration of any specific levels of asbestos in the air.

2. The air sampling and analysis scheme used by Roger Morse is improper because it was designed to exclude finding asbestos fibers typically released from Armstrong floor tile.

3. The microscopy method called "phase contrast microscopy" ("PCM") alone is not the appropriate microscopy method to assess airborne exposure to asbestos except for OSHA compliance.

4. In determining whether asbestos related property damage has occurred, fibers less than five micrometers in length should not be excluded from the analysis.

8. The Permissible Exposure Limit ("PEL") established by OSHA is not relevant to the determination of property damage.

These objections all relate in one way or another to AWI's experts' use of regulatory standards, such as the OSHA PEL, as a reference point by which to evaluate contamination. As demonstrated below, AWI's experts relied on acceptable scientific and medical data in performing their testing and forming their opinions.

While poorly articulated, it appears that the thrust of the PD Claimants' objections relate to the side-by-side air monitoring conducted by Mr. Morse in the Illinois litigation while Mr. Ewing performed his dust tests. Mr. Morse reported the results of the Illinois air monitoring using phase contrast microscopy (PCM) under the OSHA workplace standard for workers exposed to asbestos. Under the OSHA standard, an employer cannot allow exposure to workers above the PEL for asbestos, which is .1 fibers per cubic centimeter (.1 f/cc) of air, averaged over an eight-hour period of time. *See* 29 C.F.R. § 1910.1001(c)(1). The measurement of asbestos under the OSHA standard is made using PCM, with counting rules that include only fibers of 5 micrometers or greater, with an aspect ratio of 3:1. *See* 29 C.F.R. § 1910.1001. Using this standard, Mr. Morse indicated in his expert report that none of the Illinois air samples exceeded the OSHA PEL.[26]

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26 Mr. Morse also analyzed his air monitoring samples using a TEM method approved by NIOSH (Method 7402), which, consistent with the PCM results, found no hazard. One of Illinois' university safety officers, Patricia Kerst, also used the OSHA and NIOSH methods to conduct similar air monitoring after Mr. Ewing reported his dust sampling results. Significantly, the PD Claimants have not specified a standard for air monitoring that they believe *would* be more appropriate.

The PD Claimants evidently object to the "fit" of the OSHA PEL to property damage cases, because they have not alleged that Mr. Morse conducted the tests improperly or misreported the results. Unlike the settled dust method, however, the OSHA method is generally accepted, has a known rate of error, and is specifically tied to an index of risk that provides one with meaningful information. AWI does not contend that the OSHA PEL is the sole governing standard of property damage, except to the extent that a property damage claim is premised on the risk of potential exposure to maintenance and custodial personnel while working with floor products. Nonetheless, the OSHA PEL, which is a health-based standard, provides useful, scientifically reliable, information about the risk of exposure to asbestos in air, and thus should be admitted, subject to the appropriate weight to be given to it, depending on context.

2. AWI Has Never Contended That Its Air Sampling Data Must Be Taken Only During Certain Time Periods Or Activities In Order To Demonstrate The Absence Of Contamination.

The PD Claimants' fifth and sixth objections are that property damage cannot be evaluated based upon air samples (1) "taken from a room long after remediation and abatement has occurred" and (2) "performed under static conditions." It is not entirely clear to what evidence the PD Claimants refer with these two objections. AWI has consistently contended that the best measure of any exposure hazard from flooring that contains asbestos is air monitoring performed while the floor covering is in place and under the conditions and activities that typically occur in the property in question. Of course, if air monitoring cannot, for some reason, be conducted under such conditions, it may still reveal relevant and useful information, the weight of which will depend upon a number of circumstances.

AWI would obviously reserve its right to introduce evidence from a variety of samples -- including static conditions and post-remediation or abatement conditions -- but has never

contended that these circumstances must exist before the presence of contamination can be assessed. In any event, neither contention undermines the testimony of Mr. Morse, as he did not limit his air monitoring tests to either situation in Illinois.

3. Roger Morse's Attempt To Adjust Indirect TEM Results So That They Might Be Compared To Direct TEM Results Is Appropriate.

The PD Claimants' seventh contention is that "[t]he method used by Roger Morse to 'correct' the reported values of air samples and dust samples is not reliable." This contention misapprehends Mr. Morse's opinion, because as set forth above, AWI, and Mr. Morse, agree with investigators who have concluded that the processing steps involved in the indirect TEM method alter the sample and make it impossible to compare results with a sample analyzed by direct TEM. The point of Mr. Morse's adjustment was to highlight and illustrate the extent to which indirect TEM inflates asbestos counts. Furthermore, Mr. Morse relied for his adjustment factor on work by well-known asbestos expert Eric Chatfield, who generated test data showing that the indirect preparation TEM method, on average, increased asbestos counts by a factor of 32.58. Mr. Morse will testify that Mr. Chatfield's experiment was conducted with scientifically acceptable practices and that the reduction factor generated thereby is the type reasonably relied upon by experts in the field. Mr. Morse will also testify, however, that results generated by indirect TEM are inherently unreliable, especially for debris abraded from floor tile, and that he would not place a great deal of weight on structure counts generated by the indirect TEM method, regardless of whether they had been "adjusted." Accordingly, attacks upon whether the adjustment factor used by Mr. Morse is too high or too low are better directed to weight, not admissibility.

4. Dr. Price's Statistical Methods Are Reliable And Relevant To Demonstrating The Difficulties Of Estimating Health Risk From Exposures To Low Levels Of Asbestos Such As Those Involved Here.

The PD Claimants' final objection is to the "mathematical/statistical models" used by AWI expert Dr. Bert Price. Dr. Price will testify regarding issues of exposure risks relating to asbestos. As Dr. Price will explain, the PD Claimants' experts rely on a process of extrapolation to reach their conclusions that exposures to extremely low levels of asbestos can cause cancers, particularly mesothelioma. That process of extrapolation is done by reference to epidemiological data taken from persons suffering very high exposures to asbestos -- primarily asbestos workers. From those high-exposure data points, the PD Claimants' experts draw inferences about what types of risks can be associated with lower exposures.

Dr. Price relies upon his training as a biostatistician to demonstrate that the theoretical extrapolations do not serve as reliable predictors of significant health risk. In reaching his conclusions, he relies on basic mathematical, statistical and scientific precepts and methods to explain shortcomings in low dose estimations, including the failures to differentiate between types of asbestos minerals, size of asbestos fibers, and threshold exposure levels below which no disease occurs. The PD Claimants have not identified any specific shortcoming in Dr. Price's methodology, and instead, disagree only with his conclusions, which goes to weight, rather than admissibility.

V. Conclusion

For all of the foregoing reasons, AWI respectfully requests this Court to exclude any evidence offered by a PD Claimant that relies upon, or relates to, the settled dust method. In addition, AWI requests that the Court deny the PD Claimants' motion to exclude testimony and evidence of Roger Morse and Bertram Price.

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